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**BUREAU OF MINES MINERALS YEARBOOK**

# **The Mineral Industry of South Dakota**



**UNITED STATES DEPARTMENT OF THE INTERIOR**



UNITED STATES DEPARTMENT OF THE INTERIOR • Donald Paul Hodel, Secretary

BUREAU OF MINES • Robert C. Horton, Director

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# The Mineral Industry of South Dakota

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the South Dakota Geological Survey for collecting information on all nonfuel minerals.

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The value of nonfuel mineral production in South Dakota during 1984 was valued at \$193.4 million, a decrease of 13% from that of 1983 but 27% above the 10-year average. The decrease was primarily a result of lower gold prices.

South Dakota ranked 34th nationally in 1984 for the value of its nonfuel mineral production, accounting for about 1% of the U.S. total. During 1984, 5 of the 14 mineral

commodities produced in the State recorded increases in total sales value and 6 recorded production gains over those of 1983. Gold, the leading commodity produced in terms of value during 1984, contributed 58% of the State's total mineral value. Cement was the value leader among the industrial minerals produced, followed by dimension and crushed stone, collectively accounting for 32% of the State total.

Table 1.—Nonfuel mineral production in South Dakota<sup>1</sup>

Mineral	1983		1984	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:				
Masonry ----- thousand short tons ..	4	\$359	5	\$283
Portland ----- do. ....	608	37,435	619	30,773
Clays <sup>2</sup> ----- do. ....	123	353	119	343
Feldspar ----- short tons ..	7,109	107	7,219	124
Gem stones ----- NA	NA	70	NA	70
Gold (recoverable content of ores, etc.) ----- troy ounces ..	309,784	131,348	310,527	111,994
Sand and gravel (construction) ----- thousand short tons ..	<sup>e</sup> 5,100	<sup>e</sup> 11,500	5,786	12,168
Silver (recoverable content of ores, etc.) ----- thousand troy ounces ..	62	713	50	407
Stone:				
Crushed ----- thousand short tons ..	3,906	12,982	<sup>e</sup> 3,800	<sup>e</sup> 12,800
Dimension ----- do. ....	<sup>r</sup> 42	<sup>r</sup> 15,794	<sup>e</sup> 60	<sup>e</sup> 18,642
Combined value of beryllium, clays (bentonite), gypsum, lime, and mica (scrap) -----	XX	11,432	XX	5,803
Total -----	XX	<sup>r</sup> 222,093	XX	193,407

<sup>e</sup>Estimated. <sup>r</sup>Revised. NA Not available. XX Not applicable.

<sup>1</sup>Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

<sup>2</sup>Excludes bentonite; value included with "Combined value" figure.

Table 2.—Value of nonfuel mineral production in South Dakota, by county<sup>1</sup>

(Thousands)

County	1982	1983	Minerals produced in 1983 in order of value
Beadle	\$23	(2)	
Bon Homme	35	(2)	
Brookings	W	(2)	
Brown	182	(2)	
Butte	W	W	Clays.
Campbell	W	(2)	
Charles Mix	156	(2)	
Clark	75	(2)	
Clay	30	(2)	
Codington	W	(2)	
Corson	10	(2)	
Custer	298	\$1,228	Stone (crushed), mica, feldspar, beryllium.
Davison	W	(2)	
Day	89	(2)	
Deuel	204	(2)	
Dewey	49	(2)	
Douglas	W	(2)	
Fall River	181	W	Stone (crushed).
Faulk	33	(2)	
Grant	W	15,794	Stone (dimension).
Gregory	142	(2)	
Haakon	16	(2)	
Hamlin	40	(2)	
Hand	W	(2)	
Hanson	3	W	Stone (crushed).
Harding	40	(2)	
Hughes	9	(2)	
Hutchinson	W	(2)	
Hyde	100	(2)	
Jerauld	31	(2)	
Jones	90	(2)	
Lake	317	(2)	
Lawrence	W	132,431	Gold, silver, stone (crushed).
McPherson	W	(2)	
Marshall	W	(2)	
Meade	1,165	(2)	
Miner	W	(2)	
Minnabaha	516	4,129	Stone (crushed).
Moody	W	(2)	
Pennington	33,404	W	Cement, stone (crushed), lime, clays, gypsum.
Perkins	W	(2)	
Roberts	292	(2)	
Sanborn	W	(2)	
Spink	W	(2)	
Sully	509	(2)	
Turner	W	(2)	
Union	76	(2)	
Walworth	55	(2)	
Yankton	203	W	Stone (crushed).
Undistributed <sup>3</sup>	78,626	57,010	
Sand and gravel (construction)	XX	<sup>e</sup> 11,500	
Stone:			
Crushed	<sup>e</sup> 7,400	XX	
Dimension	<sup>r</sup> 14,805	XX	
Total <sup>4</sup>	<sup>r</sup> 134,208	222,093	

<sup>e</sup>Estimated. <sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data; included with "Undistributed."  
XX Not applicable.

<sup>1</sup>No production of nonfuel mineral commodities was reported for counties not listed.

<sup>2</sup>Construction sand and gravel was produced; data not available by county. Total State value is shown separately under "Sand and gravel (construction)."

<sup>3</sup>Includes gem stones and sand and gravel (construction, 1982) that cannot be assigned to specific counties and values indicated by symbol W.

<sup>4</sup>Data may not add to totals shown because of independent rounding.

Table 3.—Indicators of South Dakota business activity

	1982 <sup>r</sup>	1983	1984 <sup>p</sup>
<b>Employment and labor force, annual average:</b>			
Population	694	699	706
Total civilian labor force	330	334	346
Unemployment	18	18	15
<b>Employment (nonagricultural):</b>			
Mining total <sup>1</sup>	2.3	2.7	2.7
Metal mining <sup>2</sup>	1.3	1.6	NA
Nonmetallic minerals except fuels <sup>2</sup>	.9	.9	NA
Oil and gas extraction <sup>2</sup>	.2	.1	NA
Manufacturing total	24.8	25.9	28.6
Primary metal industries <sup>2</sup>	.2	.2	NA
Stone, clay, and glass products <sup>2</sup>	1.0	1.1	NA
Chemicals and allied products <sup>2</sup>	.2	.2	NA
Construction	8.2	8.4	8.9
Transportation and public utilities	12.5	12.3	12.0
Wholesale and retail trade	61.9	62.5	64.5
Finance, insurance, real estate	11.8	12.4	13.1
Services	52.0	54.2	58.0
Government and government enterprises	56.6	56.9	57.0
Total <sup>3</sup>	230.2	235.3	244.6
<b>Personal income:</b>			
Total	\$6,582	\$6,843	\$7,813
Per capita	\$9,407	\$9,794	\$11,069
<b>Hours and earnings:</b>			
Total average weekly hours, production workers	41.1	41.6	42.4
Total average hourly earnings, production workers	\$7.36	\$7.31	\$7.15
<b>Earnings by industry:</b>			
Farm income	\$518	\$549	\$944
Nonfarm	\$3,088	\$3,963	\$4,307
Mining total	\$66	\$74	\$80
Metal mining	\$43	\$50	\$54
Nonmetallic minerals except fuels	\$18	\$20	\$21
Oil and gas extraction	\$5	\$4	\$5
Manufacturing total	\$460	\$500	\$557
Primary metal industries	\$3	\$5	\$5
Stone, clay, and glass products	\$20	\$21	\$24
Chemicals and allied products	\$5	\$4	\$4
Construction	\$190	\$211	\$245
Transportation and public utilities	\$384	\$346	\$363
Wholesale and retail trade	\$781	\$817	\$888
Finance, insurance, real estate	\$214	\$246	\$274
Services	\$763	\$843	\$925
Government and government enterprises	\$855	\$902	\$949
<b>Construction activity:</b>			
Number of private and public residential units authorized	1,220	2,501	3,534
Value of nonresidential construction	\$77.8	\$103.1	\$104.3
Value of State road contract awards	\$78.0	\$85.4	\$101.3
Shipments of portland and masonry cement to and within the State	197	278	228
<b>Nonfuel mineral production value:</b>			
Total crude mineral value	\$134.2	\$222.1	\$193.4
Value per capita	\$194	\$317	\$274

<sup>p</sup>Preliminary. <sup>r</sup>Revised. NA Not available.

<sup>1</sup>South Dakota Department of Labor mining totals may not add because of inclusion of data from other sources.

<sup>2</sup>Bureau of Economic Analysis, Regional Economic Measurement Division, U.S. Department of Commerce.

<sup>3</sup>Data may not add to totals shown because of independent rounding.

Sources: U.S. Department of Commerce, U.S. Department of Labor, Highway and Heavy Construction Magazine, and U.S. Bureau of Mines.

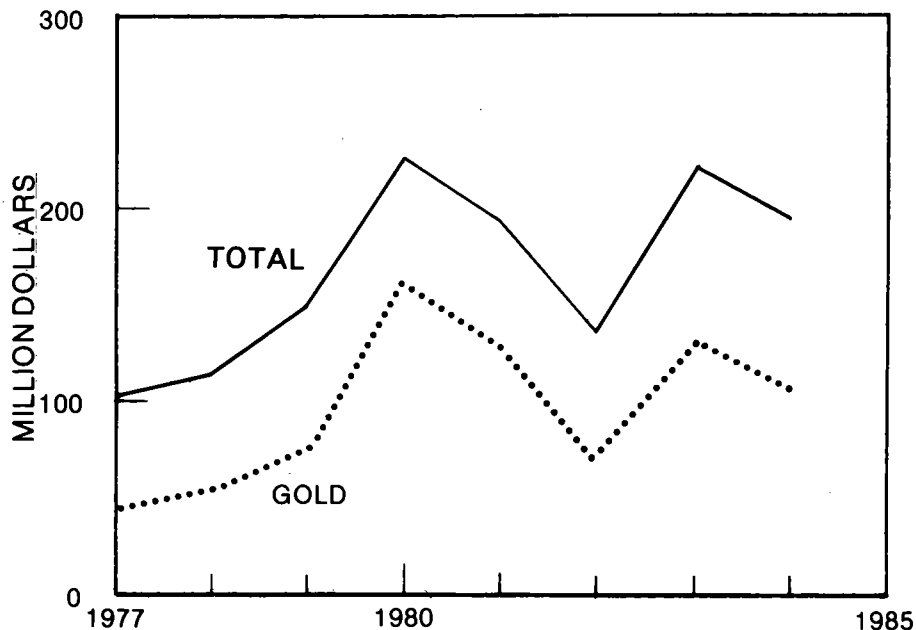


Figure 1.—Value of mine production of gold and total value of nonfuel mineral production in South Dakota.

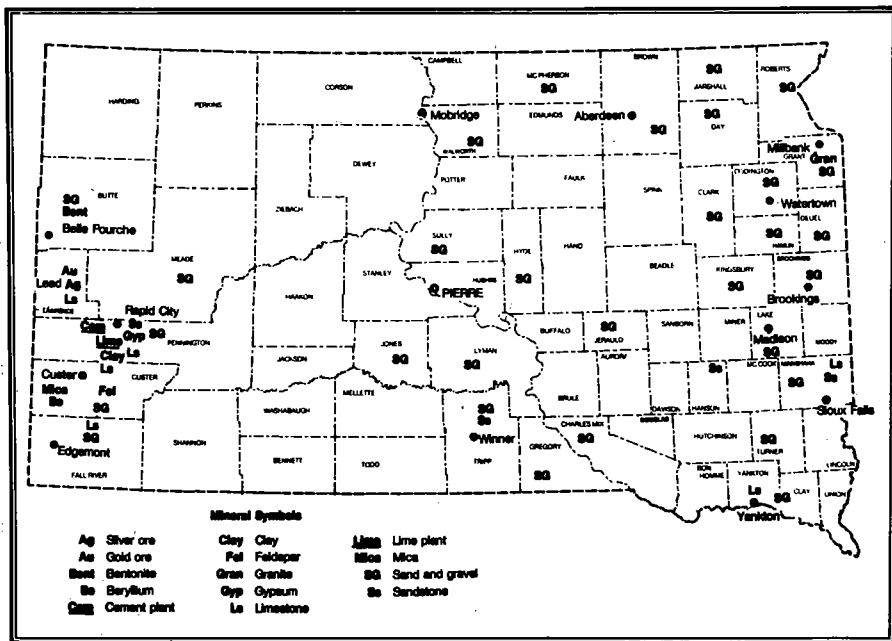


Figure 2.—Principal mineral producing localities in South Dakota.

Among the minerals produced in 1984, the quantity of gold South Dakota produced ranked second among 12 States; mica, second of 8; beryllium, second of 2; and dimension stone, fifth of 32.

**Employment.**—Figures from the South Dakota Department of Labor, Research and Statistics Division, indicated average employment in the mining industry during 1984 totaled 2,706 workers, a 2% increase compared with that of 1983. Mining industry workers represented about 1% of the State's total nonagricultural work force. During 1984, those engaged in mining received average weekly earnings of \$482.71, a 4% increase over that received in 1983.

**Trends and Developments.**—Exploration activities directed toward the search for nonfuel minerals, excluding aggregates, dropped slightly from the 1983 level. During 1984, the State issued 15 nonfuel mineral exploration permits, all indicating "gold," "silver," or "precious metals" as the principal commodity being sought. In addition, the State issued 12 mining permits for nonfuel mineral commodities, including 6 for gold or precious metals in Custer, Lawrence, and Pennington Counties; 1 for gypsum in Pennington County; and 5 for pegmatite minerals in Custer and Pennington Counties.

Near midyear, Homestake Mining Co. announced plans to commence development of its Ragged Top gold property near Savoy in Lawrence County. The property reportedly contains nearly 900,000 short tons of ore that will be mined by open pit methods at a rate of 15,000 tons per month during peak activity. The ore will be crushed on-site and transported to the company's existing mill at Lead for final processing.

During 1984, the State granted permission to Wharf Resources (USA) Inc. to increase ore-tre-waste production from 500,000 to 800,000 tons per year at its Annie Creek gold property west of Lead. A new pumping system, intended to allow the leaching process to proceed uninterrupted throughout the year, was installed at the site. Heavy rains forced a temporary shutdown of the leaching operation to avoid exceeding the holding capacity of leachate ponds containing cyanide solution. Annie Creek is South Dakota's only commercial gold heap leaching operation, and 1984 marked its first full year of operation.

Viable Resources Inc. and St. Joe American Corp., a subsidiary of the Fluor Corp.,

consummated a joint venture agreement to continue exploration and development activities on Viable's Carbonate mining properties in Lawrence County. As the result of work previously performed on the site, the presence of gold and silver has been established through 35,000 geochemical assays and the drilling of 55 holes. Reportedly, metallurgical tests indicated economic quantities of gold may be recovered by heap leaching the low-grade ore.

In August, a new \$10 million state-of-the-art, biological waste water treatment plant began operation at Homestake's gold mine in Lead. The new facilities and processes were for removal of solid wastes from discharged process wastes.

Lacana Mining Corp. of Toronto, Ontario, Canada, reported that preliminary work it conducted at the Gilt Edge property near Lead indicated proven and probable ore reserves of 5.7 million tons, grading 0.057 ounce of gold per ton. Large-scale metallurgical testing was in progress at yearend.

**Legislation and Government Programs.**—Among the bills the 1984 State Legislature enacted that related to the mining industry and the mineral resources of the State were the following:

Senate Bill 2, "Reduction of Precious Metals Severance Tax Rate," reduced the severance tax on precious metals from 6% to 2% and imposed an 8% tax on net profits.

House Bill (HB) 1066, "Environmental Laws," amended certain environmental laws, including violation of effluent standards, pollution of any State waters, regulation of generation, transportation, treatment, storage, and disposal of hazardous wastes.

HB 1107, "Damage Caused by Mineral Development," permits the commissioner of school and public lands to adjust lease rental to compensate for loss of land use owing to mineral development on school and public lands.

HB 1241, "Taxation of Severed Mineral Interests," provides for the equalization of the assessment and payment of property taxes if mineral interest has been severed.

In fiscal year 1984, the State of South Dakota received nearly \$1.7 million from the U.S. Department of the Interior as compensation for the fiscal impacts caused by the presence of certain tax-exempt Federal lands within its boundaries. These payments are in addition to the \$891,000 paid to the State during fiscal year 1984 from mineral leasing, rents, royalties, and

bonuses collected from Federal lands by the U.S. Government and shared with State governments.

Under provisions of "Title III—State Mining and Mineral Resources and Research Institutes" of the Surface Mining Control and Reclamation Act of 1977, Public law 95-87, the South Dakota School of Mines and Technology at Rapid City received a grant from the U.S. Bureau of Mines. The grant, to be matched with non-Federal funds, was intended in part to encourage graduate-level research on national and regional problems in mineral engineering, to train qualified mineral scientists and engineers, and to facilitate industry, State, and Federal cooperation in solving mineral engineering problems.

During 1984, as in 1983, the South Dakota Geological Survey (SDGS) put a major emphasis on research connected with its water resource programs. SDGS was in the final stages of a series of special water supply studies of the entire State for the U.S. Army Corps of Engineers and was completing water quality studies of selected aquifers in cooperation with the U.S. Environmental Protection Agency. All basic data from these programs, together with 11,500 drill-

ing records, 2,497 water quality records, and over 101,000 water level measurements, were entered into a computerized data-management system for readily available retrieval for interested researchers and other users.

During the year, SDGS started an investigation to determine the hydrogeology of glacial till. Understanding water movement through glacial till will have a significant impact on the development and management of water from buried aquifers and on irrigation practices of glacial till land in the State.

An ongoing program to do geologic-hydrologic study for each county in eastern South Dakota was continued in 1984 by SDGS. Under the program, which was started 20 years ago in cooperation with the U.S. Geological Survey, 38 studies have been completed or are under way. In 1983, the project expanded to incorporate a total geologic and hydrologic investigation of the entire Big Sioux Basin. This project will bring together all aspects of research within the basin; the ultimate result being a computerized ground water model allowing optimum development of the water resources through proper management.

## REVIEW BY NONFUEL MINERAL COMMODITIES

### METALS

**Beryllium.**—Pacer Corp. reported a small amount of hand-cobbed beryl production in Custer County. The quantity and value of the entire State output in 1984 was less than one-half of that for 1983. The average 1984 price for material marketed was nearly 30% below that of 1983.

**Gold.**—South Dakota ranked second behind Nevada among the 12 States reporting

gold production in 1984. Output increased slightly over that of 1983 and was 10% above the 10-year average. Total value decreased, however, owing to a \$63 per troy ounce decline in the average price compared with 1983 figures. A contributing factor to the price slump was the increasing strength of the U.S. dollar in world markets, which had the effect of weakening metal prices.

Table 4.—South Dakota: Mine production of gold and silver in terms of recoverable metal

Year	Mines producing		Material sold or treated <sup>1</sup> (thousand metric tons)	Gold (lode and placer)		Silver (lode and placer)	
	Lode	Placer		Troy ounces	Value (thousands)	Thousand troy ounces	Value (thousands)
1980	1	1	1,621	267,642	\$163,947	51	\$1,058
1981	1	1	1,677	278,162	127,854	56	587
1982	1	—	1,059	185,038	69,558	26	209
1983	2	—	1,771	309,784	131,348	62	713
1984	2	—	2,252	310,527	111,994	50	407
1876-1984	NA	NA	NA	38,614,082	1,990,011	13,643	15,930

NA Not available.

<sup>1</sup>Excludes placer gravel.

Homestake's underground mine and openpit test site at Lead and Wharf Resources's open pit mine near Terry Peak, west of Lead, accounted for the State's entire gold production. Of the 2.5 million tons of gold ore mined and processed in the State during 1984, the average recovery of gold was approximately 0.13 troy ounce per ton of material treated.

Homestake's 1984 annual report indicated that gold ore reserves at its underground mine were 19,267,000 tons at an average grade of 0.220 ounce per ton. Production at the Homestake Mine dropped 3.8% below the 1983 level. The average cost of production increased to \$324 per ounce, compared with \$301 in 1983. During 1984, the average grade of ore mined dropped 9.8% from that mined in 1983. This was a major contributor to the higher per-ounce production cost.

Mining and exploration work continued in the deep levels of the Homestake Mine below the 6,800-foot level. The new 7,550-foot level was begun, and preparation of the 6,950-foot level hoist station was initiated as part of the program to extend the No. 4 internal shaft from the 6,800-foot level to the 7,400-foot level.

Production began at Homestake's openpit test site in June after removal of approximately 2 million tons of waste rock and low-grade ore. Surface gold ore production totaled 202,000 tons at an average grade of 0.054 ounce per ton. Total gold recovered from the openpit was 10,958 troy ounces, with a mill recovery of 88%. Test mining will continue through the fall of 1985. Removal of approximately 4 million tons of waste rock and 500,000 tons of ore is planned. Evaluation of test results will determine the feasibility of commercial production at the openpit.

**Silver.**—Compared with 1983 figures, silver production, all obtained as a coproduct with gold produced at the Homestake Mine in Lead, decreased 19% in quantity and 43% in value. The average price of silver dropped to \$8.14 per troy ounce in 1984, \$3.30 per troy ounce less than in 1983.

### NONMETALS

**Cement.**—The State-owned cement plant in Rapid City was the sole source of cement manufactured in South Dakota. Output for the year increased 3% in quantity but declined 18% in value compared with that of 1983 and consisted of various types of portland cement and a prepared masonry cement. The average unit value of the

portland and masonry cement sold in 1984 was \$49.73 per short ton and \$57.01 per short ton, respectively.

The cement plant is the second largest source of State revenue, after sales taxes. In the last 3 State fiscal years, the cement plant has made a profit of \$26 million and transferred \$22 million to the State general fund. During 1984, the plant earned a profit of \$12.8 million.

With a rated clinker production capacity of about 1 million short tons per year, the plant operated at about 51% capacity for the year. Approximately 900,000 tons of mostly State-produced nonfuel materials, including clay and shale, gypsum, iron ore, limestone, and sand, were consumed in manufacturing the cement.

Ready-mix companies were the largest users of the portland cement manufactured, using approximately 48% of the 1984 output. Shipments of portland cement from the plant were handled 90% by truck, and the remainder, by rail. Nearly 97% of these shipments was in bulk form.

**Clays.**—Crude bentonite, mined from pits both within the State and out of State, was processed at American Colloid Co.'s plant near Belle Fourche in Butte County. The quantity and value of the processed material marketed during 1984 decreased sharply from the levels of 1983, and declines were reported in all use categories. The output was sold for nearly 2 dozen diverse uses, with drilling muds, foundry sand, and animal feed consuming the greatest amounts.

Common clay and shale was mined in Pennington County by the South Dakota Cement Commission for its use in manufacturing cement at its State-owned plant in Rapid City. The quantity of the common clay and shale produced in 1984 decreased 3% from that of 1983 and was 25% below the 10-year average. The unit value of the common clay produced increased to a record high of \$2.88 per ton.

**Feldspar.**—Hand-cobbed feldspar, obtained from several small mines in Custer County, was processed at a grinding mill operated by Pacer at Custer. The quantity of crude ore mined remained relatively unchanged from that of 1983. An advance of \$2.15 per ton in the average unit price of the crude during 1984 resulted in an increase of 16% in the total value for the year's output over that of 1983. The processed material was marketed principally for use in pottery with lesser amounts used in ceramic insulators. The ground material was shipped to

more than a dozen States and abroad.

**Gem Stones.**—No commercial gem stone mining operations were reported in South Dakota during 1984. The value shown in table 1 of this chapter represents an estimate for material collected by rockhounds and other hobbyists.

**Gypsum.**—The sole source of gypsum mined in the State was at a site in Pennington County operated by the South Dakota Cement Commission. The crude material produced was used exclusively in manufacturing cement at the State-owned cement plant in Rapid City. The quantity of material mined during 1984 increased 4% over that of 1983.

**Lime.**—Pete Lien & Sons Inc., the only producer of lime in the State, produced hydrated lime and quicklime at a plant in Rapid City. Lime output during the year decreased slightly in quantity compared with that of 1983, but a 4% increase in the average unit price resulted in an increase in total value. Among the principal uses of the marketed product were road and soil stabilization, sulfur removal from stack gases, and basic oxygen furnace steel.

In 1984, consumption of lime in South Dakota, obtained from all domestic sources, was approximately 21,000 short tons.

Table 5.—South Dakota: Construction sand and gravel sold or used in 1984, by major use category

Use	Quantity (thousand short tons)	Value (thou- sands)	Value per ton
Concrete aggregate	557	\$2,305	\$4.14
Plaster and gunite sands	W	W	5.00
Concrete products	W	W	1.37
Asphaltic concrete	374	979	2.62
Road base and coverings <sup>1</sup>	2,634	4,182	1.59
Fill	200	227	1.13
Snow and ice control	21	37	1.82
Railroad ballast	3	3	1.00
Other	1,998	4,434	2.22
Total <sup>2</sup> or average	5,786	12,168	2.10

W Withheld to avoid disclosing company proprietary data; included with "Other."

<sup>1</sup>Includes road and other stabilization (lime).

<sup>2</sup>Data may not add to totals shown because of independent rounding.

**Mica.**—Pacer accounted for the State's entire output in 1984. The material marketed was processed at the company's grinding mill in Custer. The quantity, value, and average unit price of the mica marketed remained at approximately the same level as recorded in 1983.

**Sand and Gravel (Construction).**—Construction sand and gravel production is surveyed by the U.S. Bureau of Mines for even-numbered years only; therefore, this chapter contains only estimates for 1983. Data for odd-numbered years are based on annual company estimates made before yearend.

In 1984, production of construction sand and gravel, the leading commodity produced in the State in terms of quantity, rose modestly over levels estimated for 1983. The average unit value for construction sand and gravel was \$2.10 per net ton, a decrease of 7% from that marketed in 1983.

Output during the year was recorded for 106 firms and government agencies operating at 183 sites throughout 50 of the State's 66 counties. Minnehaha County was the leader in production, followed by Brookings, Jerauld, Codington, and Day Counties, each recording production in excess of 250,000 tons and collectively accounting for 35% of the State total.

Table 6.—South Dakota: Construction sand and gravel sold or used by producers, by county

County	1982			1984		
	Number of mines	Quantity (thou- sand short tons)	Value (thou- sands)	Number of mines	Quantity (thou- sand short tons)	Value (thou- sands)
Beadle	1	23	\$23	1	30	\$59
Bon Homme	1	33	35	—	—	—
Brookings	1	W	W	5	505	1,184
Brown	2	70	182	2	57	161
Butte	1	24	36	2	W	130
Campbell	2	W	W	2	35	162
Charles Mix	3	79	156	4	182	373
Clark	1	54	75	10	68	71
Clay	1	23	30	—	—	—
Codington	3	W	W	5	294	817
Corson	—	5	10	2	30	30
Custer	—	—	—	10	118	260
Day	1	48	89	7	286	316
Deuel	3	94	204	9	86	173
Dewey	1	26	49	—	—	—
Douglas	1	W	W	2	35	W
Fall River	2	39	181	1	103	449
Faulk	1	19	33	1	35	35
Grant	2	W	W	9	188	259
Gregory	4	81	142	5	191	315
Haakon	1	9	16	—	—	—
Hamlin	3	37	40	3	58	67
Hand	2	W	W	—	—	—
Hanson	2	3	3	2	25	25
Harding	2	40	40	1	46	46
Hughes	1	3	9	4	35	44
Hutchinson	5	W	W	1	33	51
Hyde	3	54	100	1	54	128
Jerauld	3	22	31	8	387	864
Jones	1	70	90	1	60	113
Lake	2	93	317	5	W	305
Lawrence	—	W	W	1	29	58
Lyman	—	—	—	1	55	73
McPherson	2	W	W	7	211	260
Marshall	2	W	W	2	W	387
Meade	5	517	1,165	2	W	W
Miner	2	W	W	2	37	37
Minnehaha	6	331	516	9	565	935
Pennington	5	270	963	5	261	999
Roberts	9	120	292	13	223	581
Sanborn	—	—	—	1	15	30
Sully	1	30	509	1	68	284
Turner	2	W	W	6	245	462
Union	3	68	76	3	40	47
Walworth	1	37	55	2	77	99
Yankton	4	94	203	6	176	343
Ziebach	—	—	—	1	33	67
Undistributed <sup>1</sup>	10	1,350	2,931	18	809	1,071
Total <sup>2</sup>	108	3,816	8,604	183	5,786	12,168

<sup>1</sup>Revised. W Withheld to avoid disclosing company proprietary data; included with "Undistributed."

<sup>2</sup>Includes Brule (1984), Davison, Edmunds (1984), Kingsbury (1984), Moody, Perkins, Spink, and Tripp (1984) Counties, sand and gravel that cannot be assigned to specific counties (1982), and data indicated by symbol W.

<sup>3</sup>Data may not add to totals because of independent rounding.

In 1984, sand and gravel output was predominantly used for road base and coverings and stabilization purposes accounting for approximately 46% of the total. Other uses, in descending order of amount consumed, were for concrete aggregate, asphaltic concrete, fill, railroad ballast, and other miscellaneous uses.

Nearly 99% of the construction sand and gravel produced during the year was shipped by truck; virtually all of the remainder was shipped by rail or was not

transported.

**Stone.**—Stone production is surveyed by the U.S. Bureau of Mines for odd-numbered years only; therefore, this chapter contains only estimates for 1984. Data for even-numbered years are based on annual company estimates made before yearend.

**Crushed.**—The estimated quantity of crushed stone produced during 1984 decreased approximately 3% in quantity and 1% in value compared with that of 1983. The average unit price for the materi-

al marketed was estimated at \$3.37 per short ton.

*Dimension.*—The estimated output of dimension stone during 1984 increased both in quantity and value over that of 1983 by 43% and 18%, respectively. Granite accounted for the bulk of the production,

which was marketed principally as cut stone. South Dakota ranked fifth among the 32 States for which dimension stone production was estimated.

<sup>1</sup>State Mineral Officer, Bureau of Mines, Minneapolis, MN.

<sup>2</sup>Editorial assistant, Bureau of Mines, Minneapolis, MN.

Table 7.—Principal producers

Commodity and company	Address	Type of activity	County
<b>Beryllium concentrate:</b>			
Pacer Corp -----	Box 912 Custer, SD 57730	Mine and plant -----	Custer.
<b>Cement:</b>			
South Dakota Cement Commission.	Box 360 Rapid City, SD 57709	4 rotary kilns -----	Pennington.
<b>Clays:</b>			
American Colloid Co -----	5100 Suffield Ct. Skokie, IL 60076	Open pit mine and plant.---	Butte.
South Dakota Cement Commission.	Box 360 Rapid City, SD 57709	Open pit mine -----	Pennington.
<b>Feldspar:</b>			
Pacer Corp -----	Box 912 Custer, SD 57730	Open pit mines and dry-grinding plant.	Custer.
<b>Gold:</b>			
Homestake Mining Co -----	Box 875 Lead, SD 57754	Underground mine, cyanidation mill, refinery.	Lawrence.
Wharf Resources (USA) Inc ---	Box 897 Lead, SD 57754	Open pit mine and heap leaching.	Do.
<b>Gypsum:</b>			
South Dakota Cement Commission.	Box 360 Rapid City, SD 57709	Open pit mine -----	Pennington.
<b>Lime:</b>			
Pete Lien & Sons Inc -----	Box 440 Rapid City, SD 57709	1 rotary kiln, 1 vertical kiln, continuous-hydrator plant.	Do.
<b>Mica:</b>			
Pacer Corp -----	Box 912 Custer, SD 57730	Mine and dry-grinding plant.	Custer.
<b>Sand and gravel (construction):</b>			
W. E. Bartholow & Son Construction Co.	Route 3 Huron, SD 57350	Pits and plants -----	Jerauld.
Birdsall Sand & Gravel Co. Inc	Box 767 Rapid City, SD 57709	---do -----	Fall River, Pennington, Sully.
Bowes Construction Inc -----	Box 451 Brookings, SD 57006	---do -----	Brookings.
Fisher Sand & Gravel Co ---	Box 1034 Dickinson, ND 58601	---do -----	Pennington, Roberts, Tripp, Ziebach, Minnehaha.
Myrl & Roy's Paving Inc ----	1500 East 39th St. North Sioux Falls, SD 57101	Pit and plant -----	Turner.
Rechnagel Construction Co ---	Hurley, SD 57086	Pits and plants -----	Minnehaha and Roberts.
Sweetman Construction Inc ---	100 South Dakota Ave. Summit, SD 57266	---do -----	
<b>Silver:</b>			
Homestake Mining Co -----	Box 875 Lead, SD 57754	See "Gold" -----	Lawrence.
<b>Stone (1983):</b>			
<b>Crushed:</b>			
<b>Limestone:</b>			
Pete Lien & Sons Inc ---	Box 440 Rapid City, SD 57709	Quarries and plants -----	Custer and Pennington.
Northwestern Engineering Co. (Hills Materials Co.)	Box 2920 Rapid City, SD 57709	---do -----	Fall River and Pennington.
South Dakota Cement Commission.	Box 360 Rapid City, SD 57709	Quarry and plant -----	Pennington.
<b>Sandstone-quartzite:</b>			
Concrete Materials Co ---	Box 809 Sioux Falls, SD 57101	---do -----	Minnehaha.
L. G. Everist Inc -----	313 South Phillips Sioux Falls, SD 57101	---do -----	Do.
Spencer Quarries Inc ---	Box 25 Spencer, SD 57374	---do -----	Hanson.
<b>Dimension:</b>			
<b>Granite:</b>			
Cold Spring Granite Co	202 South 3d Ave. Cold Spring, MN 56320	Quarries -----	Grant.
Dakota Granite Co ---	Box 1351 Milbank, SD 57252	---do -----	Do.